

NEW SPECIES, VARIETIES AND COMBINATIONS FROM
THE COLLECTIONS OF THE
ARNOLD ARBORETUM

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***Ulmus laevis* Pall. var. *celtidea* (Rogov.), comb. nov.**

Ulmus glabra sensu Trautvetter in Bull. Phys.-Math. Acad. Sci. St. Petersburg. 15: 375 (1857), non Hudson, nec Miller, teste Litvinof.

Ulmus pedunculata Foug. var. *celtidea* Rogovitch, Obozr. Rast. Fl. Kiefsk. Uchebn. Okr. 533 (1869). — Koeppen, Geog. Verbr. Holzgew. Eur. Russ. 2: 33 (Beitr. Kenntn. Russ. Reich. ser. 3, VI) (1889). — Schmalhausen, Fl. Sredn. Iuzhn. Ross. 2: 533 (1897). — Chitrovo in Izv. Obtch. Uzcl. Orl. Gub. 1: 50, t. 1 (1907). — Elwes & Henry, Trees Gt. Brit. Irel. 7: 1852 (1913).

Ulmus celtidea Litvinof in Schedae Herb. Fl. Ross. 6: 167 (1908).

Ulmus celtidea f. *glabra* Litvinof, l. c.

This variety differs from the type chiefly in the oblong-lanceolate small leaves gradually narrowed into a slender acumen, broadly cuneate at the base, and coarsely and sharply doubly serrate, glabrous beneath or slightly pubescent, also in the fewer (usually 5–6) stamens and in the smaller fruit with upright tips. Litvinof raised it to specific rank but the characters by which it is distinguished do not seem to be sufficient for specific separation. A tree of this variety, received in 1910 at this Arboretum from the nursery of Regel and Kesselring at St. Petersburg, proved to be typical *U. laevis*; this agrees with the experience recorded by Henry (in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1852. 1913).

***Ulmus laevis* var. *celtidea* f. *pilosa* (Litv.), comb. nov.**

Ulmus celtidea f. *pilosa* Litvinof in Schedae Herb. Fl. Ross. 6: 168 (1908).

The type of this form was collected May 2 and 26, 1906 by W. Chitrovo in the province of "Orel, distr. Briansk. Ad ripas fl. Desna pr. lac. Orechewoje." This form of which there is a duplicate of the type specimen in this herbarium, differs from the typical *celtidea* in the pilose young branchlets and petioles and the scabrid leaves up to 10 cm. long.

***Ulmus glabra* Huds. f. *exoniensis* (K. Koch), comb. nov.**

Ulmus montana var. 9. *fastigiata* Hort. ex Loudon, Arb. Frut. Brit. 3: 1399 (1838). — Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1866 (1913).

- Ulmus glabra replicata* Hort. Dur. ex Loudon, l. c. (1838), pro synonym. praeced.
- Ulmus Fordii* Hort. ex Loudon, l. c. (1838), pro synonym. *U. m.* var. *fastigiatae*.
- Ulmus exoniensis* Hort. ex Loudon, l. c. (1838), pro synonym. *U. m.* var. *fastigiatae*.
- Ulmus scabra* g) *U. exoniensis* Hort. ex K. Koch, Dendr. 2¹: 416 (1872).
- Ulmus exoniensis* K. Koch in Wochenschr. Ver. Bef. Gartenb. Preuss. 15: 150 (1872).
- Ulmus montana* a. *genuina* 2. *exoniensis* Boulger in Gard. Chron. n. ser. 12: 298 (1879).
- Ulmus scabra* Mill. a. *pyramidalis* sensu Dippel, Handb. Laubholz. 2: 28 (1892) tantum quoad synonym. "*fastigiata, exoniensis*;" non *U. scabra* c) *U. pyramidalis* K. Koch (1872).
- Ulmus scabra* var. *fastigiata* (Loud.) Rehder in Bailey, Cycl. Am. Hort. 4: 1881 (1902). — Schneider, Ill. Handb. Laubholz. 1: 218 (1904).
- Ulmus scabra* I. *typica* 1. *genuina* lus. *fastigiata* (Schneid.) Ascherson & Graebner, Syn. Mitteleur. Fl. 4: 563 (1911).
- Ulmus glabra* f. *fastigiata* (Loud.) Rehder in Mitt. Deutsch. Dendr. Ges. 24(1915): 216 (1916); in Bailey, Stand. Cycl. Hort. 6: 3410 (1917), pro var.; non Dippel.

Though "*fastigiata*" is the oldest varietal name of this form, it cannot be used on account of the older homonym *U. glabra fastigiata* Kirchn. which is a synonym of *U. carpinifolia* var. *cornubiensis*. The next oldest legitimate varietal epithet is apparently "*exoniensis*" in *U. montana* a. *genuina* 2 *exoniensis* Boulger, if *U. scabra* f. *U. exoniensis* Hort. ex K. Koch (l. c.) is ruled out as an illegitimate combination, though Koch validates here the epithet "*exoniensis*" by a good description.

Dippel cites K. Koch as the author of his *U. scabra* a. *pyramidalis*, but Koch's *U. scabra* c. *U. pyramidalis* does not belong here, since he describes the leaves as smooth above, similar to those of *U. tiliaefolia* Host which belongs to *U. carpinifolia*. Koch's variety may be referable to *U. carpinifolia* var. *cornubiensis*, since he states that it has the habit of a Lombardy poplar.

***Ulmus glabra* f. *monstrosa* (Schneid.), comb. nov.**

- Ulmus montana monstrosa* Hort. ex Schelle, in Beissner, Schelle & Zabel, Handb. Laubholz-Ben. 87 (1903), nomen.
- Ulmus scabra* var. e. *nana* f. *monstrosa* Schneider, Ill. Handb. Laubholz. 1: 218 (1904).
- Ulmus scabra* I. *typica* 1. *genuina* m. *monstrosa* (Schneid.) Ascherson & Graebner, Syn. Mitteleur. Fl. 4: 562 (1911).

A compact shrub often with fasciated branches and leaves 5–8 cm. long, partly pitcher-shaped at base and on a slender petiole to 2.5 cm. long.

Ulmus carpinifolia Gleditsch, Pflanzenverz. 354 (1773). — Rupp. ex Suckow, Oek. Bot. 40 (1777). — Borkhausen, Vers. Forstbot. Beschr. Holzart. 35 (1790); Theor.-Prakt. Handb. Forstbot. 1: 839 (1800). — Schkuhr, Handb. 1: 176 (1808). — Lindley, Syn. Brit. Fl. 226 (1829).¹ — Druce, Brit. Pl. List, ed. 2, p. 103 (1928); Comital Fl. Brit. Isles, 266 (1932).

Ulmus campestris Linnaeus, Sp. Pl. 225 (1735), pro parte.

Ulmus glabra Miller, Gard. Dict. ed. 8 (1768), non Huds. (1762), "glabris."

Ulmus sativa Du Roi, Harbk. Baumz. 2: 502 (1772), non Miller (1768).

Ulmus campestris var. *glabra* Aiton, Hort. Kew 1: 319 (1789).

Ulmus nuda Ehrhart, Beitr. 6: 86 (1791), pro parte.

Ulmus foliacea Gilibert, Exerc. Phytol. 2: 395 (1792). — Schneider in Oester. Bot. Zeitschr. 66: 79 (1916). — Rehder in Bailey, Stand. Cycl. Hort. 6: 3412 (1917). — Johanson in Svensk Bot. Tidskr. 15: 8 (1921); in Lustgaard 5: 62 (1924); in Bot. Notis. 1932: 200. — Hayek, Prodr. Fl. Penins. Balc. 1: 91 (1924). — Rehder, Man. Cult. Trees Shrubs, 188 (1927).

Ulmus campestris β. *U. carpinifolia* Rupp. ex Suckow, Anfangsgr. Theor. Angew. Bot. 2: 138 (1786). — Borkhausen in Rhein. Mag. Naturk. 1: 498 (1793). — Kittel, Taschenb. Fl. Deutschl. ed. 3, 1: 276 (1853).

Ulmus nitens Moench, Meth. 333 (1794). — Henry in Henry & Elwes, Trees Gt. Brit. Irel. 7: 1894 (1913). — Moss, Cambridge Brit. Fl. 1: 89 (1914). — Lynch in Jour. Roy. Hort. Soc. 41: 16, f. 11 (1915). — Rehder in Mitt. Deutsch. Dendr. Ges. 24(1915): 218 (1916). — Stern in Jour. Bot. 70, suppl. p. 21 (1932). — Turrill in Kew Bull. 1933: 232.

Ulmus surculosa var. *glabra* Stokes, Bot. Mat. Med. 2: 37 (1812).

? *Ulmus reticulata* β. ? *sepearia* Dumortier, Fl. Belg. 25 (1827), pro parte.

Ulmus campestris Spielart b. *carpinifolia* G. F. W. Meyer, Chloris Hann. 80 (1836).

Ulmus campestris α. *nuda* Koch, Syn. Fl. Germ. 637 (1837), pro parte.

Ulmus campestris var. *laevis* Spach in Ann. Sci. Nat. sér. 2, 15: 362 (1841). — Planchon in Ann. Sci. Nat. sér. 3, 9: 273 (1848).

Ulmus campestris var. γ. *Orme glabre* Mathieu, Fl. For. 194 (1858) "synon: *U. nitens* Moench, *U. carpinifolia* Ehrh."

Ulmus suberosa var. *glabra* Syme in Sowerby, Engl. Bot. ed. 3, 8: 138 (1868).

Ulmus campestris c. *laevis* 1. *carpinifolia* (Lindl.) Boulger in Gard. Chron. n. ser. 12: 298 (1879).

Ulmus glabra α. *typica* f. 1. *carpinifolia* Pospichal, Fl. Oester. Küstenl. 1: 347 (1897).

Ulmus sativa Mill. g. *carpinifolia* (Lindl.) Druce, List Brit. Pl. 63 (1908).

¹According to Moss, Cambridge Brit. Fl. 2: 89 (1914), *U. carpinifolia* Lindl. represents *U. glabra* × *nitens*.

Ulmus vulgaris var. *carpinifolia* (Math. & Fl.) Rouy, Fl. France, **12**: 266 (1910).

Ulmus campestris a. *glabra* 3. *carpinifolia* Ascherson & Graebner, Syn. Mitteleur. Fl. **4**: 555 (1911).

For additional citation of literature see Schneider in Oester. Bot. Zeitschr. **66**: 79 (1916) and Stearn in Jour. Bot. **70**: suppl. p. 21 (1932).

The species under discussion was included by Linnaeus and many later authors in the species *U. campestris*, a name now proposed as a *nomen ambiguum rejiciendum*,¹ a proposal which will doubtless be accepted by the next International Botanical Congress. In dividing the Linnean concept of *U. campestris* into several species, the name *U. campestris* was kept by most English authors for the English elm, *U. procera* Salisb., while most botanists of continental Europe applied it to the species under discussion which is the elm most widely distributed in Europe. During the past twenty-five years various botanists, abandoning the name *U. campestris* as of uncertain application, have used three different names for the species here called *U. carpinifolia*, namely *U. glabra* Mill., *U. foliacea* Gilib. and *U. nitens* Moench. The first of these names is invalidated by the earlier homonym *U. glabra* Huds. which is the valid name for the species known also as *U. scabra* Mill. and *U. montana* Stokes. The second name is also an illegitimate name, since it is evidently a renaming of *U. campestris* L. without any attempt to separate it as a distinct species from the Linnean *U. campestris* which is quoted simply as a synonym. Gilibert states clearly in the preface that he has changed such Linnean names which seemed meaningless to him; he says (p. xlv): "mea nomina trivalia feci, quae attributi plantae adhaerentis et sensibilis ideam excitant; arbitraria plurima nihil significantia, desumpta a statione, viribus, etc. repudiavi." The third name *U. nitens* Moench, is also a renaming of a species already described under the name *U. carpinifolia* cited by Moench as a synonym and credited by him to Ehrhart, but I have not been able to find mention of this name in Ehrhart's works. Evidently *U. carpinifolia* Gleditsch (1773) is the oldest available name applicable to this species; it is based on "Ulmus carpini folio seu cortice arboris albido" of Ruppium Fl. Jen. ed. Haller. 330 (1745), as is clearly shown by the citation under *U. carpini folio*² in Gleditsch, Syst. Einleit. Forstwiss. **1**: 240 (1775) where Ruppium is cited. The brief description in German, of which that of *U. nitens* by Moench is hardly superior, and

¹cf. Sprague & Green in Kew Bull. **1933**: 503; see also Suringar in Mitteil. Deutsch. Dendr. Ges. **41**: 39-41 (1929), and Kew Bull. **1935**: 74.

²In his Systematische Einleitung Gleditsch still retains the prelinnean names, while in his Pflanzenverzeichnis published two years earlier he had already adopted Linnean binomial nomenclature.

the comparison with the other species described indicates clearly the species Gleditsch had in mind, though the Latin phrases added apparently only as synonyms are contradictory and do not apply to the same species. The description by Suckow (1777 and 1786) who credits the species to Ruppius, refers only to the whitish bark. Borkhausen (1790) enumerates it as *U. carpiniifolia* Gleditsch and says that it differs from *U. campestris* only in the smoother grayish or whitish bark and somewhat smaller leaves. As appears from the synonymy given above, the name *U. carpiniifolia* has been used by several later authors for the species and has been employed as the name of a subdivision of a binomial by Suckow (1786), Borkhausen (1793), by G. F. W. Meyer (1836), Kittel (1853), Boulger (1879), Pospichal (1897), Druce (1908), Rouy (1910), Ascherson & Graebner (1911) and Moss (1914). By Moench (1794) it is cited as a synonym of his *U. nitens*, by Spach (1841) and by Planchon (1848) as a synonym of *U. campestris* var. *laevis*, by Koch (1837) as a synonym of his *U. campestris* a. *glabra*, by Mathieu (1858) as a synonym of his *U. campestris* var. γ . by Borbas (Bekesvarm. Fl. 55. 1881) under *U. glabra* and by Schneider (1916) as a synonym of *U. foliacea*.

As *Ulmus carpiniifolia* appears to be the oldest and only valid name applicable to the species under discussion, the following new combinations become necessary.

Ulmus carpiniifolia* f. *variegata (Dum. Cours.), comb. nov.

Ulmus campestris var. *U. glabra variegata* Dumont de Courset, Bot. Cult. ed. 2, 6: 384 (1811).

Ulmus glabra 9. *variegata* Loudon, Arb. Frut. Brit. 3: 1405 (1838).

Ulmus nitens var. *variegata* (Dum. Cours.) Henry in Elwes & Henry, Trees, Gt. Brit. Irel. 7: 1895 (1913).

Ulmus foliacea var. *variegata* Rehder in Stand. Cycl. Hort. 6: 3413 (1917).

A form with the leaves variegated with white.

None of the names of variegated forms given by Weston, Bot. Univ. 1: 314–315 (1770) can be applied with certainty to this form of the smooth-leaved elm, since none of his three species of English elms can be identified with this species; his *U. campestris* represents the English elm, *U. glabra* the Wych elm which is *U. glabra* Huds., not Mill., and *U. hollandica* is the Dutch elm.

Ulmus carpiniifolia* f. *pendula (Schneid.), comb. nov.

Ulmus campestris f. *pendula* Dippel, Handb. Laubholzk. 2: 24 (1892), non David, nec Kuntze.

Ulmus glabra var. d. *pendula* (Dipp.) Schneider, Ill. Handb. Laubholzk. 1: 220 (1904), pro parte.

- Ulmus glabra* var. *d. pendula* f. *Wentworthii* Schneider, l. c. (1904).
Ulmus campestris a. *glabra* a. *vulgaris* 1. *pendula* (Dipp.) Ascherson & Graebn. Syn. Mitteleur. Fl. 4: 554 (1911).
Ulmus campestris var. *pendula* Rehder in Bailey, Cycl. Am. Hort. 4: 1882 (1902).
Ulmus nitens var. *pendula* (Rehd.) Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1893 (1913).
Ulmus foliacea var. *pendula* Rehder in Bailey, Stand. Cycl. Hort. 6: 3413 (1917).

A form with pendulous branches. The plant described as *U. campestris pendula* David in Rev. Hort. sér. 2, 4: 101 (1845) seems to belong according to the description either to *U. pumila* L. or *U. parvifolia* Jacq., and *U. campestris* 4b. *pendula* Kuntze, Taschenfl. Leipzig, 214 (1867) is probably *U. glabra* f. *pendula* (Loud.) Rehd.

***Ulmus carpiniifolia* f. *tiliaefolia* (Host), comb. nov.**

- Ulmus tiliaefolia* Host, Fl. Austr. 1: 329 (1827).
Ulmus glabra f. *tiliaefolia* Borbas, Békésvarm. Fl. 55 (1881).
Ulmus glabra var. a. *typica* f. *tiliaefolia* (Host.) Schneider, Ill. Handb. Laubholz. 1: 220 (1904).
Ulmus campestris a. *glabra* 1. *tiliaefolia* (Host) Ascherson & Graebner, Syn. Mitteleur. Fl. 4: 555 (1911).

A form with ovate leaves rounded or subcordate and usually not strongly oblique at the base.

***Ulmus carpiniifolia* f. *betulaefolia* (Loud.), comb. nov.**

- Ulmus campestris* 11. *betulaefolia* Loudon, Arb. Frut. Brit. 3: 1376 (1838).
Ulmus betulaefolia Loddiges Cat. (1836) ex Loudon l. c. (1838) pro synonym. praeced.
Ulmus campestris a. *nuda* subvar. *betulaefolia* Hort. Vilv. ex Wesmael in Bull. Soc. Hort. Belg. 1862: 389 (1863).
Ulmus campestris c. *laevis* 2. *betulaefolia* (Loud.) Boulger in Gard. Chron. n. ser. 12: 298 (1879).
? *Ulmus sativa* Mill. f. *angustifolia* Druce, List Brit. Pl. 63 (1908), nom. nud.
Ulmus nitens var. *betulaefolia* (Loud.) Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1896 (1913).
? *Ulmus carpiniifolia* b. *angustifolia* Druce, Brit. Pl. List, ed. 2, p. 103 (1928), nom. nud.

A tree of pyramidal habit with ascending branches and elliptic to elliptic-oblong leaves 4–8 cm. long, narrowed towards the unequal base.

***Ulmus carpiniifolia* var. *Hunnybuni* (Moss) Druce, Brit. Pl. List, ed. 2, p. 103 (1928).**

- Ulmus nitens* var. *hunnybuni* Moss, Cambridge Fl. 2: 90, pl. 90, 91 (1914).

Large tree with the lower branches spreading, the upper somewhat tortuous; leaves rather narrow, narrow-elliptic or narrow-ovate to oblong-ovate to oblong-obovate, 5–10 cm. long, distinctly doubly serrate, acuminate, very unequal at base; fruit obovate 14–18 mm. long.

Ulmus carpinifolia* var. *Sowerbyi (Moss) Druce, Brit. Pl. List, ed. 2, p. 103 (1928).

Ulmus glabra Smith, Engl. Bot. 32: 2248, t. (1811), *synon. exclud.*

Ulmus tortuosa Host, Fl. Austr. 1: 330 (1827).

Ulmus nitens var. *sowerbyi* Moss, Cambridge Brit. Fl. 2: 90 (1914). — Lynch in Jour. Roy. Hort. Soc. 41: 16, fig. 12 (1915).

Similar to var. *Hunnybuni*, but a smaller tree with the upper branches very tortuous, the leaves smaller, acute, and the fruits smaller, elliptic to obovate.

Ulmus carpinifolia* var. *cornubiensis (West.), *comb. nov.*

Ulmus campestris 7. *cornubiensis* Weston, Bot. Univ. 1: 315 (1770).

Ulmus campestris β . *stricta* Aiton, Hort. Kew, 1: 319 (1789), *pro parte.*

Ulmus reticulata α . *stricta* (H. H. Lond. nec dec.) Dumortier, Flor. Belg. 25 (1827).

Ulmus stricta Lindley, Syn. Brit. Fl. 227 (1829).

Ulmus campestris var. *cornubiensis* Loudon, Arb. Frut. Brit. 3: 1376 (1838).

Ulmus campestris d. *fastigiata* (Audib. Cat.) Spach in Ann. Sci. Nat. sér. 2, 15: 362 (1841). — Planchon in Ann. Sci. Nat. sér. 3, 9: 273 (1848).

Ulmus glabra 2. *fastigiata* Kirchner in Petzold & Kirchner, Arb. Musc. 560 (1864).

Ulmus glabra var. *c. stricta* (Loud.) Schneider, Ill. Handb. Laubholzk. 1: 220 (1904).

Ulmus sativa *c. stricta* (Lindl.) Druce, List Brit. Pl. 63 (1908).

Ulmus nitens var. *stricta* (Ait.) Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1888 (1913).

Ulmus foliacea var. *stricta* (Ait.) Rehder in Bailey, Stand. Cycl. Hort. 6: 3412 (1917).

(? \times) *Ulmus stricta* (Lindl.) Bancroft in Jour. Bot. 75: 344 (1937).

A narrow pyramidal tree with ascending branches. The oldest name for this variety is Weston's *U. campestris cornubiensis*; though it is only briefly characterized by the words "cornubiensis, foliis minoribus," there can be no doubt to which elm the name applies, since the tree was well known in England as Cornish elm. By several English authors this is considered a distinct species under the name of *U. stricta* Lindl. with the following form as a variety.

Ulmus carpinifolia* var. *cornubiensis* f. *sarniensis (Loud.), *comb. nov.*

Ulmus campestris 8. *sarniensis* (Lodd.) Loudon, Arb. Frut. Brit. 3: 1376 (1838).

Ulmus campestris *Wheatleyi* Simon-Louis, Cat. 1869: 98. — Bean in Gard. Chron. ser. 3, 41: 149, fig. 67 (1907).

Ulmus nitens var. *Wheatleyi* (Simon-Louis) Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1891, pl. 412, fig. 21 (1913).

Ulmus stricta var. *Wheatleyi* Bean, Trees Shrubs Brit. Isl. 1: 86, t.; 2: 620 (1914).

Ulmus foliacea var. *Wheatleyi* Rehder in Bailey, Stand. Cycl. Hort. 6: 3412 (1917).

(? ×) *Ulmus sarniensis* (Moss) Bancroft in Jour. Bot. 75: 345 (1937).

Ulmus stricta var. *sarniensis* Moss in Gard. Chron. ser. 3, 51: 199 (1912).

Closely related to the preceding variety, but with narrower head formed of stiffly ascending long branches, with broader leaves and flowers with white, not pink, stigmas. Loudon's description is insufficient but is apparently applicable to this form, since it is called "Jersey elm."

***Ulmus carpinifolia* var. *cornubiensis* f. *Webbiana* (Simon-Louis), comb. nov.**

? *Ulmus campestris* 17. *concaevifolia* Hort. ex Loudon, Arb. Frut. Brit. 3: 1378 (1838).

Ulmus campestris *Webbiana* Lee ex Simon-Louis, Cat. 1869: 97.

Ulmus glabra var. *Webbiana* Lee ex Hartwig, Ill. Gehölzb. 392 (1892).

Ulmus nitens var. *Webbiana* (Simon-Louis) Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1895 (1913).

Ulmus foliacea var. *Webbiana* (Lee) Rehder in Bailey, Stand. Cycl. Hort. 6: 3413 (1917).

A form of var. *cornubiensis* with leaves folded longitudinally.

***Ulmus carpinifolia* var. *Dampieri* (Wesm.), comb. nov.**

Ulmus campestris a. *nuda* subvar. 6. *fastigiata* *Dampieri* Hort. Vilv. ex Wesmael in Bull. Féd. Soc. Hort. Belg. 1862: 389 (1863).

Ulmus montana 3. *Dampieri* Hort. ex Kirchner, Arb. Musc. 563 (1864).

Ulmus scabra var. *Dampieri* Hort. ex Hartwig, Ill. Gehölzb. 393 (1892).

× *Ulmus Dippeliana* f. *Dampieri* (Kirchn.) Schneider, Ill. Handb. Laubholzk. 1: 218 (1904).

Ulmus nitens var. *Dampieri* Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1894 (1913).

Ulmus foliacea var. *Dampieri* (Kirchn.) Rehder in Bailey, Stand. Cycl. Hort. 6: 3412 (1917).

This variety is of fastigiate habit with upright curved branches and crowded broad leaves, deeply toothed, almost lobulate, with crenate-serrate teeth. It is similar in habit to *U. glabra* var. *exoniensis* (K. Koch) Rehd. and has been confused with that variety.

Ulmus carpinifolia var. **Dampieri** f. **Wredei** (Jühlke), comb. nov.

Ulmus Dampieri var. *Wredei* Jühlke in Hamb. Gart.-Blumenzeit. **33**: 485 (1877).

Ulmus campestris Wredei Hort. ex Lauche, Deutsch. Dendr. 347 (1880).

Ulmus montana var. *Dampieri aurea* Wrede ex Jaeger & Beissner, Ziergeh. ed. 2, 403 (1884).

Ulmus montana var. *Dampieri Wredei* Ruempler, Gartenbau-Lex. 930 (1890). — Rehder in Möller's Deutsch Gärt.-Zeit. **13**: 160, fig. (1898).

Ulmus scabra var. *Dampieri* var. *Wredei* (Jühlke) Hartwig, Ill. Gehölzb. 393 (1892).

Ulmus montana var. *fastigiata aurea* Hort. ex Nicholson, Kew Hand-list Trees Shrubs, **2**: 141 (1896).

Ulmus Dippeliana f. *Wredei* (Hort.) Schneider, Ill. Handb. Laubholz. **1**: 218, fig. 136p (1904).

Ulmus nitens f. *Wredei* Rehder in Mitt. Deutsch. Dendr. Ges. **24**(1915): 218 (1916).

Ulmus foliacea var. *Wredei* Rehder in Bailey, Stand. Cycl. Hort. **6**: 3413 (1917).

This is a yellow-leaved form of the preceding variety and like that, has been confused with *U. glabra* var. *fastigiata* (Loud.) Rehd.

Ulmus carpinifolia var. **umbraculifera** (Trautv.), comb. nov.

Ulmus campestris var. *umbraculifera* Trautvetter in Act. Hort. Petrop. **2**: 590 (1873). — Spaeth in Monatschr. Ver. Gartenb. Preuss. **22**: 19, fig. 1 (1879).

Ulmus glabra var. *a. typica* f. *umbraculifera* (Dipp.) Schneider, Ill. Handb. Laubholz. **1**: 220 (1904).

Ulmus densa Litvinov in Sched. Herb. Fl. Ross. **6**: 163, no. 1991, t. 1, 2 (1908). — U. S. Bur. Pl. Indust. Bull. Pl. Introd. **78**: 478, t. (1912).

Ulmus campestris a. *glabra* a. *vulgaris* l. *umbraculifera* (Spaeth) Ascherson & Graebner, Syn. Mitteleur. Fl. **4**: 553 (1911).

Ulmus nitens var. *umbraculifera* (Trautv.) Henry in Elwes & Henry, Trees Gt. Brit. Irel. **7**: 1893 (1913).

Ulmus foliacea var. *umbraculifera* (Trautv.) Rehder in Bailey Stand. Cycl. Hort. **6**: 3412 (1917).

This variety forms a dense subglobose head and also differs in its rather small often nearly simply serrate leaves. It is planted as a street tree in Turkestan and Persia and was introduced into European gardens from Persia about 1878.

Ulmus carpinifolia var. **umbraculifera** f. **gracilis** (Spaeth), comb. nov.

Ulmus campestris umbraculifera gracilis Spaeth, Cat. no. **100**: 121 (1897).

Ulmus glabra a. *typica* f. *gracilis* (Spaeth) Schneider, Ill. Handb. Laubholz. **1**: 220 (1904).

Ulmus campestris a. *glabra* a. *vulgaris* 1. *gracilis* (Schneid.) Ascherson & Graebner, Syn. Mitteleur. Fl. 4: 553 (1911).

Ulmus nitens var. *umbraculifera gracilis* (Spaeth) Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1893 (1913).

Ulmus foliacea var. *gracilis* (Spaeth) Rehder in Bailey, Stand. Cycl. Hort. 6: 3412 (1917).

A form of the preceding variety with slenderer more crowded branches and smaller leaves. Originated in Spaeth's nursery near Berlin.

***Ulmus carpinifolia* var. *umbraculifera* f. *Koopmanni* (Spaeth), comb. nov.**

Ulmus Koopmanni Lauche ex Spaeth, Cat. no. 62[1885-86]: 6, 101 (1885).

Ulmus campestris var. *Koopmanni* Hort. ex Nicholson in Kew Hand-list Trees Shrubs, 2: 135 (1896), nomen.

Ulmus glabra a. *typica* f. *koopmanni* (Spaeth) Schneider, Ill. Handb. Laubholz. 1: 220 (1904).

Ulmus campestris b. *nuda* 2. *Koopmanni* (Lauche) Ascherson & Graebner, Syn. Mitteleur. Fl. 4: 557 (1911).

Ulmus nitens var. *Koopmanni* (Spaeth) Rehder in Mitt. Deutsch. Dendr. Ges. 24(1915): 218 (1916).

Ulmus foliacea var. *Koopmanni* (Lauche) Rehder in Bailey, Stand. Cycl. Hort. 6: 3412 (1917).

A form of var. *umbraculifera* similar in leaf, but with an ovoid head if grafted high, shrubby and stoloniferous if propagated by cuttings. Henry (in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1927, 1913) refers this form as a variety to *U. pumila* L., but the cultivated plants I have seen do not belong to that species.

***Ulmus carpinifolia* var. *suberosa* (Moench), comb. nov.**

Ulmus suberosa Moench, Verz. Bäume Weissenst. 136 (1785).

Ulmus tetranda Schkuhr, Bot. Handb. 1: 178, t. 58b (1791).

Ulmus campestris 6. *U. fungosa* Dumont de Courset, Bot. Cult. 3: 700 (1802).

Ulmus campestris β. *suberosa* (Ehrh.) Wahlenberg, Fl. Carpat. 71 (1814).

Ulmus campestris f. *suberosa* (Ehrh.) Voss, Vilmorin Blumengärt. 1: 906 (1895).

Ulmus glabra b. *suberosa* (Moench) Gürke in Richter & Gürke, Pl. Eur. 2: 72 (1897). — Schneider, Ill. Handb. Laubholz. 1: 220 (1904).

Ulmus vulgaris β. *suberosa* (Koch) Rouy, Fl. France, 12: 266 (1910).

Ulmus nitens var. *suberosa* (Moench) Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1885 (1913).

Ulmus foliacea var. *suberosa* (Moench) Schneider in Oester. Bot. Zeitschr. 66: 79 (1916).

This variety differs chiefly in the corky-winged branches, in the usually shrubby habit and the small leaves often more or less rough above.

Ulmus carpinifolia var. **suberosa** f. **propendens** (Schneid.), comb. nov.

Ulmus suberosa var. *pendula* Lavallée, Arb. Segrez. 236 (1877), nom. nud.

Ulmus campestris var. *microphylla pendula* Hort. ex Nicholson in Kew Hand-list Trees Shrubs, 2: 135 (1896), nom. nud., huc ducendum secundum Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1888 (1913).

Ulmus campestris suberosa pendula Siesmayer in Möller's Deutsch. Gärtn.-Zeit. 16: 163, fig. (1901), non *U. campestris pendula* David, nec Ktze., nec Dipp.

Ulmus glabra var. *suberosa* f. *propendens* Schneider, Ill. Handb. Laubholz. 1: 220 (1904).

Ulmus campestris B. *suberosa* a. *fruticosa* 1. *propendens* (Schneid.) Ascherson & Graebner, Syn. Mitteleur. Fl. 4: 560 (1911).

A form of the preceding variety with pendulous branches.

Ulmus carpinifolia var. **italica** (Henry), comb. nov.

Ulmus nitens var. *italica* Henry in Elwes & Henry, Trees Gt. Brit. Irel. 7: 1892, t. 411, fig. 9 (1913).

Ulmus foliacea var. *italica* (Henry) Rehder in Bailey, Stand. Cycl. Hort. 6: 3412 (1917).

A geographical variety found in southern Europe and Algeria and differing chiefly in the leaves having 14–18 pairs of lateral veins.

Photinia Tsaii, sp. nov.

Frutex 0.5–1.5 m. altus vel arbor ad 7 m. alta, ramulis initio dense floccoso-tomentosis mox glabratis et demum glabris fusco-brunneis lenticellatis. Folia coriacea, lanceolata vel oblonga, 4–7 cm. longa et 10–17 mm. lata, acuminata, basi in petiolum 3–6 mm. longum attenuata, dense serrulata vel crenato-serrulata dentibus subadpressis vel leviter incurvis, supra rugulosa glabra, subtus reticulata, venis utrinque 8–11 curvatis et ante marginem anastomosantibus ut costa prominentibus, initio subtus tomento floccoso detergibili obtecta, mox glabrescentia, demum ut petioli glaberrimi. Flores non visi. Corymbus fructiferus 4–5 cm. diam., congestus, ramulis et pedicellis glabratis dense et conspicue lenticellatis, pedicellis 2–5 mm. longis; fructus ovoideus, 8–10 mm. longus, 6–8 mm. latus, ruber, glaber, dentibus calycis triangularibus erectis pubescentibus coronatus; ovarium tertia vel quarta parte superiore semiglobosa excepta cupulae adnatum, 2–3-loculare; semina 2–6, fusco-brunnea, 4–4.5 mm. longa.

YUNNAN: Shang-pa Hsien, alt. 1500–2000 m., *H. T. Tsai*, 54959, Oct. 28, 1933 (type, in herb. Arnold Arb.); 54688, Sept. 28, 1933; 58945, Oct. 24, 1934.

This new species seems most nearly related to *P. stenophylla* Hand.-Mazz., which is easily distinguished by the glabrousness of the branches and leaves, by the smaller inflorescence with slender smooth branchlets and pedicels. It may also be compared with *P. loriformis* W. W. Sm. which chiefly differs in the persistent grayish or fulvous appressed tomentum of the under side of the leaves and their remote spinulose serration, and by the absence of lenticels from the branches and the inflorescence. *Photinia loriformis*, which is remarkable for its dimorphous foliage, occurs also in southern Szechuan where it was collected near Hui-li-chuo by C. Schneider (no. 4068, March 24, 1914).

Prunus tenella Batsch, Beytr. Entw. Pragm. Gesch. Drey Natur-Reiche, 29 (1801).

Amygdalus nana Linnaeus, Sp. Pl. 473 (1753). — Pallas, Fl. Ross. 12, t. 6 (1784). — Curtis, Bot. Mag. 5: t. 161 (1792). — Schmidt, Oester. Baumz. 4: 25, t. 205 (1822). — Spach in Ann. Sci. Nat. sér. 2, 19: 113 (1843).

Amygdalus georgica Desfontaines, Hist. Arb. Arbriss. 2: 221 (1809). — Jaume St.-Hilaire, Fl. & Pom. Franç. 4: t. 364 (1831).

Prunus nana (L.) Stokes, Bot. Mat. Med. 3: 103 (1812). — Focke in Engler & Prantl, Nat. Pflanzenfam. III. 3: 54 (1888). — Non Du Roi.

Amygdalus nana var. *georgica* Schmidt, Oester. Baumz. 4: 25, t. 204 (1822). — DC. msc. ex Seringe in DeCandolle, Prodr. 2: 530 (1825). — Schneider, Ill. Handb. Laubholzk. 1: 598, fig. 333c¹ (1906).

Amygdalus nana a. *vulgaris* DC. mss. ex Seringe in DeCandolle, Prodr. 2: 530 (1825). — Medvedyef, Dereb. Kust. Kabkas. 79 (1883).

Amygdalus fruticosa Wenderoth in Schrift. Beförd. Ges. Naturwiss. Marburg, 2: 252 (1831). — Schlechtendal in Bot. Zeit. 23: 339 (1863), "*fruticosa*."

Amygdalus Ledebouriana Schlechtendal in Abhandl. Naturf. Ges. Halle, 2: 21 (1854); in Hamburg. Gart. Blumenzeit. 11: 305 (1855).

Amygdalus Heuckeana Schlechtendal in op. cit. 22 (1854); in op. cit. 11: 305 (1855).

Amygdalus Pallasiana Schlechtendal in op. cit. 14 (1854); in op. cit. 11: 301 (1855); in Bot. Zeit. 23: 341, t. 12, fig. B, 1 (1865).

Prunus nana a. *typica* Beck, Fl. Niederöstr. 817 (1891); in Reichenbach, Ic. Fl. Germ. 25, 2: 7, t. 88, fig. 1-5 (1913).

Prunus nana f. *georgica* (Desf.) Voss, Vilmorin's Blumengärt. 1: 232 (1894).

Prunus nana var. a. *georgica* (DC.) Schneider, Ill. Handb. Laubholzk. 1: 599, fig. 333c¹ (1906). — Ascherson & Graebner, Syn. Mitteleur. Fl. 6, 2: 141 (1906).

Since *Prunus nana* (L.) Stokes is a later homonym of *P. nana* Du Roi, the next oldest name *P. tenella* Batsch has to take its place under the genus *Prunus*.

The species shows considerable variation in the size and shape of the

leaves and of the fruit, in the length of the calyx-lobes, also in the more or less intense coloring of the flowers; several species have been distinguished but the characters gradually pass into each other and none of them seem to be concomitant. Therefore, only one variety is here maintained, characterized chiefly by broader generally obovate leaves, and several forms of horticultural rather than botanical interest.

Prunus tenella* f. *alba (Schneid.), comb. nov.

Amygdalus nana L. γ . *flore albo* Koch, Hort. Dendr. 138 (1853). — Mouillefert, Traité Arb. Arbriss. 1: 394 (1892).

Prunus nana var. *a. georgica* f. *alba* Schneider, Ill. Handb. Laubholz. 1: 599 (1906).

Prunus nana var. *alba* Bean, Trees Shrub Brit. Isles, 2: 245 (1914).

This differs from typical *P. tenella* in its white flowers.

Prunus tenella* f. *angustifolia (Spach), comb. nov.

Amygdalus nana L. γ . *angustifolia* Spach in Ann. Sci. Nat. sér. 2, 19: 111 (1843).

Prunus nana var. *georgica* f. *angustifolia* Schneider, Ill. Handb. Laubholz. 1: 599 (1906).

This form differs from the type in its very narrow linear-lanceolate leaves.

Prunus tenella* f. *Gessleriana (Kirchn.), comb. nov.

? *Amygdalus nana* δ . *flore purpureo* Koch, Hort. Dendr. 139 (1853).

Amygdalus Gessleriana Hort. ex Kirchner in Petzold & Kirchner, Arb. Musc. 241 (1864).

Amygdalus nana speciosa Carrière in Rev. Hort. 1872: 118; 1874: 370, pl.

Amygdalus nana var. *speciosa* Mouillefert, Traité Arb. Arbriss. 1: 394 (1894).

Prunus nana f. *Gessleriana* Voss, Vilmorin's Blumengärt. 1: 232 (1894). — Schneider, Ill. Handb. Laubholz. 1: 599 (1906).

Prunus nana A. *Georgica* b. *Gessleriana* (Schneid.) Ascherson & Graebner, Syn. Mitteleur. Fl. 6, 2: 141 (1906).

Prunus nana rubra Anon. in Gard. Chron. ser. 3, 52: 390, pl. (1912).

Prunus nana var. *Gessleriana* [Nicholson in] Kew Hand-list Trees Shrubs, 209 (1902), nomen. — Bean, Trees Shrubs Brit. Isles, 2: 245 (1914).

Prunus nana var. *rubra* Hort. ex Bailey, Stand. Cycl. Hort. 5: 2832 (1916).

The chief character of this form is the intensely red color of the flowers particularly the buds which are described by Kirchner (l. c.) as beautifully carmine-red. The colored plates cited above bear out this statement.

Prunus tenella var. **campestris** (Besser), comb. nov.

Amygdalus campestris Besser, Enum. Pl. Volhyn. 46, 58 (1822). — Host, Fl. Austr. 2: 2 (1831). — Reichenbach, Fl. Germ. Excurs. 646 (1832).

Amygdalus nana δ . *campestris* Seringe in DeCandolle, Prodr. 2: 530 (1825).

Amygdalus Besseriana Schott in Cat. Hort. Vindob. 1818 ex Seringe, l. c. (1825), pro synonym. praeced. — Schlechtendal in Abh. Naturf. Ges. Halle, 2: 17 (1854); in Bot. Zeit. 23: 341, t. 12, fig. B2 (1864).

Amygdalus nana var. β . *A. Besseriana* Schott ex Bosse, Vollst. Handb. Blumengärt. 1: 254 (1840).

Amygdalus sibirica Loddiges, Bot. Cab. 16: t. 1599 (1829), descript. manca. — Tausch, in Flora, 17: 491 (1834). — Schlechtendal in Abh. Naturf. Ges. Halle, 2: 20 (1854); in Hamburg. Gart. Blumenzeit. 11: 270 (1855).

Amygdalus nana β . *latifolia* Ledebour, Fl. Alt. 2: 210 (1830); Fl. Ross. 2: 2 (1844). — Spach in Ann. Sci. Nat. sér. 2, 19: 111 (1843).

Amygdalus nana var. 5. *sibirica* Lodd. Cat. ex Loudon, Arb. Frut. Brit. 2: 674 (1838).

Amygdalus Gaertneriana Schlechtendal in Abh. Nat. Ges. Halle, 2: 18 (1854); in Hamburg. Gart. Blumenzeit. 11: 262 (1855); in Bot. Zeit. 23: 341, t. 12, fig. B, 3 (1865).

Amygdalus nana 2. *sibirica* Tausch ex Kirchner in Petzold & Kirchner, Arb. Musc. 241 (1864).

Amygdalus nana b. *latifolia* Medvedyef, Dereb. Kust. Kabkas. 79 (1883). — Akinfiyef in Trudi Obshch. Ispyt. Prirod. Kharkof Univ. 27: 276 (Fl. Centr. Cauc.) (1892).

Prunus nana β . *campestris* Beck, Fl. Niederoestr. 817 (1891); in Reichenbach, Ic. Fl. Germ. 25, 2: 8, t. 88, fig. 6–9 (1913). — Schneider, Ill. Handb. Laubholzk. 1: 599, fig. 333c (1906).

? *Prunus nana* α . *typica* f. *spathulata* Beck, l. c. (1891).

Prunus nana f. *campestris* Ser. ex Voss, Vilmorin's Blumengärt. 1: 232 (1894).

This variety differs from the type chiefly in its broader and larger leaves, elliptic or elliptic-oblong to obovate-elliptic or oblong-obovate, at least on the sterile branches, narrower sepals more than half as long as the tube, usually narrower petals and suborbicular fruit. None of these characters, however, seems to be entirely stable and reliable. The color of the flower is given by Besser as white, but Ledebour (Fl. Ross. 2: 2) states that the plants raised from seed of *A. campestris* sent by Besser himself had pink flowers, and as almost all later authors describe this variety as having pink flowers, I have enumerated below the white-flowered plant as a distinct form of this variety.

Prunus tenella var. **campestris** f. **albiflora** (Schneid.), comb. nov.

Prunus nana var. *campestris* f. *albiflora* Schneider, Ill. Handb. Laubholzk. 1: 599 (1906).

Prunus nana β . *campestris* lus. *albiflora* Ascherson & Graebner, Syn. Mitteleur. Fl. **6**, **2**: 141 (1906).

Amygdalus latifolia alba Hort. ex Schneider l. c. (1906), pro synonym. praeced. — Ascherson & Graebner, l. c. (1906), pro synonym. praeced.

? *Prunus nana* var. *cochinchinensis* Bailey, Cycl. Am. Hort. **3**: 1456 (1901); Stand. Cycl. Hort. **5**: 2832 (1916); not *Amygdalus cochinchinensis* Lour.

This differs from *P. nana* var. *campestris* in its white flowers. The normal color of that variety is apparently pink, but Besser described his *P. campestris* as white-flowered (see the remarks under var. *campestris*).

Of the following varieties and forms I have seen no specimens:

Amygdalus nana β *biserrata* Spach in Ann. Sci. Nat. sér. 2, **19**: 110 (1843).

Amygdalus nana microflora Carrière in Rev. Hort. **1872**: 340. — Mouillefert, Traité Arb. Arbust. **1**: 394 (1892).

Amygdalus nana campanuloides Carrière, l. c. — Mouillefert, l. c.

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